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FACTS IN THE LIFE-HISTORY OF THE POLLACK, *GADUS POLLACHIUS.*

By Matthias Dunn.*

When full-grown, Pollack have very peculiar traits, apparently combining in one species the habits of more than one of the *Gadidæ*, sometimes showing the intense love of locality of the Bib, and at another evincing all the wild and roving disposition of the Hake. Thus for months together in spring and summer Pollack generally live in a uniform hunt-and-rest life, congregating by day around the rocky ledges of the sea-bottom near the deepest water, circling around a certain spot, and often in such numbers as to appear like a living column standing in the sea. At such times these creatures seem to be resting or sleeping (as most fish sleep), probably with one half or more of their senses and functions of the body really at rest. When in this state Pollack will not attack or prey on the smaller fishes unless they come very near or within the circle.

With the night the scene changes; then, thoroughly awake, every Pollack leaves the circle, and, hungry and ravenous, each steals away to hunt on his own account. But few living fishes come amiss to their stomachs. With the morning light all return to their old haunts.

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* Communicated to the Polytechnic Society, Falmouth. The names of fish adopted are those employed by Couch.

BRITISH MUSEUM

In the autumn this systematic life may be broken up at any time by the passing near to the reef of a shoal of Sprats, Pilchards, or Anchovies. The sight of these calls forth all the wolfish propensities of the Pollack, which steal away after them, leaving the ledge probably for ever to gorge on these small fry.

The autumn migrations of the Pilchard afford a grand time for the Pollack. Then almost every circle on the coast is broken up, especially in the undisturbed haunts around the Land's End and Scilly Isles, and they continue to follow the shoals along the coast, and often far up the English Channel, keeping to the high ground when seeking rest, but always with their eyes on the object of their pursuit, and seldom taking to settled life again until some time after spawning in March.

When catching prey the habit of the Pollack is to sneak along quietly until within darting distance of their object; then calling into use their powerful fins they dart like arrows on their victims. This is also their habit in taking the bait. There is no coaxing or waiting on the part of the fisherman for them to swallow it, as with the Hake or Conger; as a rule, they rush like a Salmon taking a fly.

As to the question whether the food of the Pollack is swallowed head or tail first, I think that all dead and wounded fish are taken into the stomach as they are found, but all live food is swallowed head foremost, those not caught in this way being turned in the mouth. There is more readiness with the mouth of fish than is generally supposed. I have seen Pollack stop short in their dart at food, and play it in and out of their mouths, as if tasting it, finally leaving it—such food being probably stale, or sodden with water. The chief reason why the Pollack swallows live food head downward is that it does not bite or tear its food in pieces like the Carnivora, but simply swallows it alive, often without a scratch. If the head were upwards in the stomach, no doubt the little fellows would force their way out again while the Pollack was in the act of securing other prey. How long they remain alive in the stomach of the larger *Gadidæ* —for all take their food in the same manner—it is difficult to say. I have known Pollack drawn up from a depth of eighty feet, and taken into the boat and killed, and on being opened I have seen Pilchards and Herrings taken alive from their stomachs. These fishes must have been secured and swallowed some time before the Pollack took the fatal bait.

Young Pollack do not take to circling until above four pounds weight, probably in the third year of their existence. Before that time they may be found on any rocky bottom, but more especially where the ground is very rough near the shore.

When shoals of Sprats or Launces appear, the Pollack will congregate also in shoals, and with a rush attack them. An evening rout once seen will hardly be forgotten, for they will dart against the sides of a boat, if in the line of their attack, when on their hungry errand.

When about four months old, before taking the bait, they may often be seen to put their lips against the line, and in this manner to swim along and trace it up to the surface of the sea; they are seldom caught after tracing the line.

Again, on some of the extensive ledges off our coasts, it has been found that all Pollack do not concentrate on one spot, but several circles may be found on one ledge. That each fish in these circles has a knowledge of locality and of its own haunt may be learnt from the fact that the practical fisherman, in some instances, knows where these circles may be found, and will fish on the best of them when it suits his purpose; and although he may catch all the fish in one circle, and days may pass between his fishing on the other parts of the reef, it will be found that this has in no way lessened the numbers living in the other circles. Although, being night-feeders, the fish must of necessity, when hunting the ledge, pass by and over this depopulated haunt, the old associations are too strong for them to think of occupying it.

Many fishes have the power of changing their colour, and adapting themselves to the nature of the ground on which they are living. This has been noticed in the Pollack. Those living on the reefs where the long dark *Laminaria* sea-weed abounds will be found to be of a dark olive, varying very little from the colour of the weeds; while those found in deeper water, where the rocks are lighter, will be very much of their colour. This is also observable in young Pollack, which, when food is scarce, will entirely leave the rocky and weedy sea-bottom, and hover around the brown sands in which the Sand Launce takes up its night-quarters. It will then be seen that these Pollack are quite brown in colour—in fact, are the very shade of the sand over which they have been swimming.

In the spring of the year the little red Pollack may be found inshore. They have a decided tinge of red in the fins, and sometimes streaks of red running down through the olive of the belly; while others are dark orange along the sides and belly, mottled with blue spots and streaks. Couch, in his 'British Fishes,' remarks on small Pollack being bright orange on the sides, caused by living in the shelter of the rocks clothed with sea-weeds. But this red colour can scarcely arise from this cause, seeing that three had a decided tinge of red when caught, and these were from the surface of the sea, not from the rocks. I have seen Pollack as much as seven pounds weight with a red tinge in the fins and red markings running down their sides.

A coating of transparent mucus envelopes the whole fish; in summer it is reduced to a very thin film; in winter it increases to more than the sixteenth of an inch in thickness, and no doubt protects the fish in cold weather.

Diseases.—These seem to be very few in the Pollack. One form is the wasting of the liver, caused by the boring though it of the parasite, *Filaria piscium.* Another disease is like that which is so common to the Cod, Bream, Mackerel, and Garfish, *viz.*, curvature of the spine. Pollack affected with this disease seldom reach five pounds in weight, while full-grown, well-fed fish have been known to attain to twenty-four pounds.

Parasites.—Very few of these are found on the Pollack, probably from their living so near to suitable places for scraping them off: the large close-standing stems of some of the olive sea-weeds and the projecting points of rock are admirably suited for this purpose. A very common expression with fisher-boys, when fishing for young Pollack near shore in clear water and expecting a bite, is, "Look out! I saw a Pollack turn bright side up." The idea conveyed is that a Pollack is close by, and may be expected to take the bait; and this turning "bright side up," which they often do, by scraping their backs along the weeds and rocks, is no doubt the act of raking off the parasites. I only know three parasites common to this species—the *Lepeoptheirus;* the young of a sessile-eyed crustacean belonging to a species of *Cirolana* (the latter is also found in great numbers in the Red

Mullet); and *Filaria piscium*, discoverable in the cavity of the belly.

Enemies.—Gulls and Guillemots destroy immense quantities of Pollack when very young—just after being hatched. When a month old they live on the surface of the sea, keeping close to all kinds of floating *débris*. At such times the sea-birds scarcely ever leave them. Porpoises also often attack them. It is nothing uncommon in clear water close to shore to see the Porpoises dart along the sides of the rocks and devour them. In the summer of 1878, when the fishing-boat 'F. H.,' of Mevagissey, was passing over the high ledges off the Gribben Head, Cornwall, the crew saw a shoal of Porpoises attack a circle of large Pollack, killing scores of them. They tacked the boat, and took up quantities of large fish, the Porpoises having destroyed more than they could eat. Sometimes when going at full speed a Porpoise will seize a Pollack, and play with it as a cat will with a mouse, and by some power unknown to me throw it three or four feet out of the water forward, the next instant catching it again in its jaws. I have known this done four or five times in succession with a Pollack of about three pounds weight. A Porpoise will sometimes seize a large Pollack by the middle with his powerful jaws, and other Porpoises will swim around and eat the poor victim alive from the mouth of the holder.

These savage creatures, no doubt, are the cause of the skulking habits of the Pollack, so annoying to the amateur fisherman; for this fish when hooked will, if possible, rush away from his enemies in among the large sea-weeds, or into some sheltered hole in the rocky sea-bottom, so that the amateur with his fine gear is often unable to draw him out. Our fishermen, when after large Pollack, go in the day-time where the fish are circling. The crew consists of two men, each provided with sixty fathoms three-quarter pound lines, with snooding six feet long. One of these is used without a sinker, the other with it. The lines used in this way will cover a greater amount of ground than any other from a stationary boat, and thus enable the fishermen to correct any slight error made in anchoring on the circling ground, as it is impossible to be successful in fishing by day unless the baits go right into the circle. The baits should be Mackerel, Pilchards, Cuttles, or young Bream.

A fisherman can always tell the kind of fish he has to his line by its actions on the hook. Every fish has its own peculiar action: thus the Pollack when hooked starts off at a sharp angle for the sea-bottom, and if prevented from reaching it, will then try to get away by force, and acts very much like a flying kite on being pulled to the ground. The fishermen call it "shearing about." After failing to free itself by this mode, it suddenly turns and darts towards the boat, at the same time disgorging the contents of its stomach by turning it inside out, hoping by these means to clear out the hook.

For small Pollack the most successful mode of capture is "whiffing." This operation is carried on by two men; one rowing a small boat about two miles an hour, the other attending to one or two lines towed without sinkers over the stern. The bait should be a thin slice cut from the tail of a Mackerel or Pilchard; worms from the sea-beach or small eels; or artificial baits, as supplied by Hearder or Brooks, of Plymouth. The most successful "whiffer" I ever knew fished with an angling-rod over the quarter of the boat with the line weighted, the snooding entirely of catgut, and with artificial baits. Small fish are also often caught in trammels, ground-nets, and seines, when used for Mackerel and Red Mullet. Pollack a few months old will rise to the fly.

Breeding.—In many fishes the procreative instinct is active some months before actual spawning commences, as in the Herring and Pilchard. This has been noted under two aspects. The first is extreme restlessness and change of locality, until a suitable spawning-ground is found. The second is a state of quietude, and only the taking of such food as will keep the body in its normal condition. These phases of life may be discerned in more than one species of fish. We can scarcely trace the former in the Pollack, but we believe we can the latter. For although so active and voracious in autumn, but little is seen of them in February and March, although from long observation we are certain March is the general time of those fish spawning off our coasts. That they are then living not far from land may be concluded from the fact that they may be found only a few miles off the coast in April, thin and hungry; while about the middle of the same month young Pollack, just escaped from the egg, may be seen on the surface of the sea, close to land. That the eggs float on the surface when shed seems probable, seeing that the liver of a full-grown Pollack is very large, and contains several ounces of oil, all of which escapes among the eggs at the time of spawning, and no doubt helps to float them. It is also a fact that the oil leaves the liver of all the fish of the species at the time of spawning. Like all the *Gadidæ*, the Pollack carries a large number of eggs. I have found as many as four millions in the roe of a Pollack twelve pounds in weight. The time the eggs take to hatch cannot be stated with precision; but taking the 15th of March as the average date of the parent spawning, I have often seen young Pollack of a half-inch in length from the 15th to the 20th of April, which could not be more than from ten to fifteen days old. This will make the period of hatching from fourteen to eighteen days.

On the matter of spawning and incubation of fishes there is much to be said. Scientists tell us that the spawning of Salmon in the British Isles continues from September to January, and that the Herring may be found breeding off our shores in every month of the year. But this statement requires qualification; for although generally true, the facts do not apply to every coast, since each locality has its own especial time; thus it will be found that Herrings are always in spawn off Plymouth about the first of January, whereas at Mevagissey the great Atlantic Herrings do not spawn until the 10th of March. Possibly future researches may show that on other coasts the Pollack may spawn at some different time.

GROWTH.—On this subject I must refer to my specimens.

No. 1 bottle contains several young Pollack, from a half-inch to an inch long. These were caught in Mevagissey Bay on May 4th, about fifty yards from land, on the surface of the sea, close to some floating sea-weeds. The colours are not yet diffused, but held in spots and stars; the fins white and transparent; and no scales are found on them when under three-quarters of an inch in length. The largest are just an inch long, and two grains in weight. I estimate them to be about a month old.

No. 2 contains young Pollack caught near the same place, close to the bottom of the sea, on June 3rd. Taking the average of two of the largest, it will give a Pollack one inch and three-quarters long and eleven grains in weight. It will now be observed that they have all their fins and colours perfect, and are fairly on the line of living as the parent fishes. These I estimate to be two months old.

No. 3 contains young Pollack caught at the same place as above, on July 6th. The two largest give an average fish of three inches long and sixty grains in weight, and estimated at three months old.

No. 4 contains young Pollack from the same place, caught on August 14th. These two give an average length of five inches, and 225 grains in weight, and are estimated to be four months old.

No. 5 bottle has two young Pollack caught at Mevagissey on the 25th of September, 1884. Average five inches and six-eighths in length, and 362 grains in weight. These are probably a little over five months old.

I give these lengths and weights with the greatest confidence, knowing they represent the monthly growth of the first Pollack which reached the shores around Mevagissey for the year 1885, and also, with very little change, in the same months for ten years past. These little creatures are as familiar to me as barn-door fowls are to the farmer. The figures show the increase in four months to be one hundred times their original weight.

I may here state that throughout my observations on these little fishes I have kept to those which first reach the shore, and these throughout the season, as a rule, are the largest. Some young Pollack do not float in for two or three weeks after the first, probably through contrary winds and tides, or later spawning; hence these will be behind the earlier examples in growth and condition throughout the season. Besides this there are the accidents of food, health, and other conditions, which keep some of the season's fish back to less than five inches in length up to November, and after this, like the Mackerel and Red Mullet, there is but little, if any, growth among the young Pollack until the following May. In further tracing their growth it will be seen that the summer is the time of their greatest development, and that some will reach maturity in the third and others in the fourth year of life.

NOTES ON THE ORNITHOLOGY OF NORTHAMPTONSHIRE AND NEIGHBOURHOOD.

By the Right. Hon. Lord Lilford.

Owing to the circumstances mentioned in my last communication on Northamptonshire birds (Zool. 1886, p. 465), and my leaving Lilford for Bournemouth (whence I now write) shortly afterwards, the following notes are given entirely upon the authority of correspondents, of whose good faith in every instance, and accuracy of identification in the great majority of occurrences quoted, I have not the slightest doubt.

October 8th, 1886. My brother saw two Golden Plovers on an old pasture near Aldwinkle. I heard reports of this species being seen in our neighbourhood in the latter half of September, but the above is the first appearance this autumn, of which I feel quite certain.

Oct. 15th. Four Teal were brought alive from our decoy, with twelve Wild Ducks.

Oct. 28th. Eight Fieldfares seen at Biggin, near Oundle, and Grey Crows,—"now in abundance since N.E. wind,"—at the same place, reported to me by my brother-in-law, Mr. T. H. Burroughes.

Oct. 30. Donald Mackay, gamekeeper at Aldwinkle, writes that one of Lord Lyveden's keepers flushed two Woodcocks near Brigstock on Sept. 26th.

November 1st. Colonel Irby wrote to me that he was assured by one of our game-watchers that he saw one of three Wild Ducks suddenly seized and taken under water by some invisible foe near Pilton Bridges, within a short distance from Lilford. I have no doubt that an Otter was the "secret agent" in this instance.

Nov. 5th. My falconer reported the sudden appearance about Lilford of a great number of Jays, the scarcity of which species till this date has been somewhat remarkable.

Nov. 6th. Sir Rainald Knightley wrote to me, under this date, from Fawsley, near Daventry, as follows:—"Last year we had a Night Heron—at least it was exactly like the picture of that bird in Gould. It remained here nearly all the autumn, some two or three months, but left when the frost and snow came. But to my surprise, on my return from Scotland a few days ago, I found it (or another bird exactly like it) here again. I do not know how long it has been here, as I have been away from home for about five weeks." (*Cf.* my note of July 13th, Zool. 1886, p. 468). Sir Rainald adds, "Crested Grebe, *Podiceps cristatus*, have nested here last year and this."

Nov. 16th. I received a letter from Captain J. A. M. Vipan, of Stibbington Hall, near Wansford, in which he states, "Whilst out punting on the Wash, on October 28th, I killed a Red-throated Diver with the red-throat patch. I also killed a Black-throated Diver on November 12th—the first I have ever seen on the Wash."

In two letters, dated respectively Nov. 9th and 16th, Lieut.-Colonel G. Morgan, writing from his residence, Biddlesden Park, near Brackley, very kindly informed me that "The late Dr. Leith Adams once spent three days here. He was especially pleased with the Crested Tits, *Parus cristatus*, which we then had here, but I have not observed them for four or five years past." In the second letter he wrote, in reference to this species, "Curiously enough, my son saw one twice on Saturday last, and I believe I saw it myself on Sunday morning, but am not absolutely certain." Colonel Morgan's house stands in Buckinghamshire, close to the river Ouse, which there forms our county boundary, and as the post town (Brackley) is in Northamptonshire, I consider that I may fairly record this occurrence in these notes.

Nov. 14th. Thirty Wild Geese (sp. ?) seen flying over Achurch in an easterly direction. Bramblings seen at Tichmarsh—first report of the species in our neighbourhood for this season.

Nov. 17th. Twenty-two Teal out of twenty-nine, and eighteen Wild Ducks, out of about one hundred, were taken in our decoy.

Nov. 18th. My falconer wrote under this date:—"I have seen eight Siskins and six Redpolls by the river (near Lilford) last week. These are not nearly so plentiful as they were last year."

20th. A Great Grey Shrike, *Lanius excubitor*, was picked up dead near Aldwinkle by Lieut.-Colonel Irby. My son, who was present at the finding of this bird, wrote, "It had doubtless been taken with bird-lime, with which a twig close by was covered." This bird was sent for me to London to be preserved, and proved to be a young female.

December 9th. I received a very handsome and peculiar female hybrid of Common Mallard, *Anas boschas*, and Australian Wild Duck, *A. superciliosa*, from our decoy. The upper plumage, crown of head, back of neck, back, wings, and tail closely resemble those of the Common Wild Duck, but the characteristic buff superciliary streak of the Australian is strongly developed, and the whole of the lower plumage from chin to tail are of a rich creamy buff colour. I sent this interesting variety to the Natural History Museum, South Kensington. I may mention that I have for many years kept some of the Australian Wild Ducks upon the aviary ponds at Lilford, and that many of our Wild Ducks show "a strain" of that blood, but the specimen above described is the first *variety* of the cross that has hitherto come to my hands.

Dec. 30. Under this date my decoyman wrote:—"I caught seven Ducks on 29th, and left forty, and three Wigeon, in the decoy. There were three Red-headed Dunbirds, *Fuligula ferina*, in the decoy on 24th."

January 3rd, 1887. The Rev. W. Powys, Rector of Achurch, wrote, "I have just seen a Snow Bunting in my field." My falconer wrote:—"On December 27th a Peregrine Falcon soared over the courtyard for five minutes; her attention was taken up with the Kites and Buzzards (in the home aviary): she came within half gun-shot of me. I afterwards saw her chasing the Wild Ducks up and down the river."

Jan. 3rd. The decoyman reported fifteen "Grey Geese" (sp. ?), near Aldwinkle.

Jan. 5th. "Great flights of Sky Larks going southwards; snow seven or eight inches deep."—T. H. Burroughes, Biggin, Oundle.

Jan. 6th. Captain Vipan wrote to me from Sutton Bridge:—"My punter last Monday came across a *white* Mallard in a bunch of about 100. To-day some thousands of Larks passed over the Wash; all seemed very tired. There were also a good many Bramblings, one of which settled on my punter's head, fell off on to the floor of punt, and afterwards flew off;

some that I noticed on the floating ice seemed very brilliant in colour."

Jan. 7th. Colonel Irby wrote from Wadenhoe, "I saw a Redshank, *Totanus calidris*, on Wednesday." The Redshank visits our neighbourhood occasionally and irregularly, generally in August or September; but I consider its appearance there at this time of year, and in such severe weather, as well worthy of record.

Jan. 13th. A Waxwing, *Ampelis garrulus*, seen at Stoke Doyle, near Oundle, and reported to me on excellent authority.

Jan. 18th. My falconer wrote:—"About half-past four on the afternoon of 12th, when I went to take in the Goshawk from her block, I found her fighting with a Tawny Owl. I got hold of it at once, found that it was not much hurt, and placed it with the others (of the same species) in the Owl-house. I am glad to say it is quite well."

Jan. 24th. The same man wrote:—"I have often seen Tawny Owls on wing about here this winter before dark, which I think is very unusual for these birds."

February 1st. The decoy-man reported "quite 500 head of wildfowl—Ducks, Wigeon, Teal, and Pochards"—on our flooded meadows near Thrapston; the decoy impracticable from the depth of water and the floating ice.

Feb. 17th. One of my gamekeepers wrote:—"I have found six Green Woodpeckers dead of starvation from hard frost and snow. More Wild Geese than usual flying over this winter; I saw twenty-nine on Jan. 13th, and several more lots of eight or nine, of which I have not got the date."

March 16th. A young Puffin, *Fratercula arctica*, arrived alive at Lilford from the Rev. Sir F. Robinson, Bart., of Cranford, Kettering, who informed me that it was picked up near that place. This bird fed freely upon small fishes, and lived till April 2nd.

March 17th. Heard of Stock Dove sitting on her eggs at Lilford on 18th inst.

March 18th. The Hon. Thos. W. Fitzwilliam wrote:—"The Herons (at Milton, Peterborough) are about as numerous as usual, I think; about ninety-three nests now, but I do not think that all have built yet."

March 22nd. Chiffchaff first reported, by Colonel Irby.

March 25th. A male Pintail, which had been for many days apparently paired with a Wild Duck on our decoy-pool, disappeared.

March 26th. Tawny Owl's nest, with three eggs "hard set," found near Lilford.

March 29th. Sand Martin first reported near Lilford.

April 6th. My falconer wrote:—"Hearing that a strange bird had been shot at Winwick (about five miles from Lilford), on March 26th, I went over, and found it was a young female Peregrine. The shooter told me that he shot a Wood Pigeon, and before he had time to pick it up this hawk came from a great height, and was carrying her prize away when he shot, and slightly injured the first joint of her right wing. She looks well in health, and I think she will get all right in a short time." I purchased this Falcon, and heard from my man on April 13th that he put her on the wing (in a creance) on the previous day, and that there did not appear to be "much wrong" in her flight.

April 12th. Willow Wren first reported near Lilford. Mr. G. Hunt wrote to me from Wadenhoe:—"Towards the close of the proceedings (shooting Wood Pigeons over wooden decoy-birds), near Oundle Wood on 11th inst., a female Peregrine came flying high towards me, and seeing my lures, which were placed on a bare newly-sown field, made a terrific stoop at one of them, which was pegged firmly into the ground, and drove her hind claw into the neck of the dummy, knocked it some five yards off its peg, and then flew straight away, and I could see something was hanging from under her tail, and suspect she broke her foot with the violence of the collision. This was an old blue Falcon. I never in all my experience in 'coying' had a similar thing occur. On Easter Sunday I found a nest containing two young Stock Doves almost ready to fly; on the previous day I had seen some of this species in flocks—evidently travellers."

April 14th. A nest of the Barn Owl near Lilford contained four eggs. My decoy-man, who is an East Anglian, and ought to know the birds below mentioned well, wrote:—"I saw twenty Dotterel, *Eudromias morinellus*, on the 13th and three on the 14th April." This is the first well-authenticated occurrence of the Dotterel in Northamptonshire that has come to my knowledge, the only previous one being a somewhat hazy report of a bird of this species having killed itself against the telegraph-wires on the L. & N.W. Railway, near Thorpe, about forty years ago.

April 15th. My falconer wrote:—"I have ten young Wild Ducks hatched off on the 2nd, and since then two more sittings, all doing well. I heard young Rooks in the nests last evening, for the first time this year."

NOTES ON THE FAUNA OF ICELAND.

By Uno von Troil, D.D.

[On taking up lately a somewhat scarce little volume entitled 'Letters on Iceland,' containing observations made during a voyage in 1772, by Sir Joseph Banks, Dr. Solander, Dr. Lind, and Dr. von Troil, we were struck by the remarks therein contained on the mammals and birds of Iceland, some of which, although written more than a century ago, are still of much interest at the present day. The alleged existence of the Wild Cat (doubtless a mistake), the herbivorous habits of the Fox, the introduction of the Reindeer from Norway in 1770, the breeding of the Wild Swan and the "Eider-bird," and the annual exportation of Eider-down, and of Iceland Falcons purchased by royal falconers, are matters on which some of our readers may be glad to have information. We accordingly give the following extract (pp. 140—147, ed. 1780) for their benefit. The "Letter" from which it is copied is addressed to Chevalier Ihre, and is dated "Stockholm, Oct. 3, 1774."—Ed.]

Besides these [domesticated] animals, they have three kinds of dogs in Iceland, *fiar hundar*, or *lumbar*, shag dogs; and *dyrhundar* and *dverghundar*. As also tame and wild cats, which last are called *urdarkettir;* rats, white and brown foxes, some of which eat grass, and are on that account called *gras tofur*. To root out these animals, the king has set a premium of a rix-dollar upon every ten fox-skins that are sold to a merchant. The natives have likewise made an agreement, that whosoever destroys a fox's hole, together with the fox, the she fox, and their young, is to receive one rix-dollar, which the neighbours collect among themselves.

Reindeer were not known here formerly; but by Governor Thodal's order thirteen heads were sent from Norway in 1770, by Mr. Perenson, merchant, ten of which died before they reached Iceland, for want of proper care; the three remaining ones thrive extremely well, and had calved three times before we came there; they do not want for food, as the country abounds with moss.

After having treated of their fishery and the breed of their cattle, I think this a very proper place to say something of their birds, which, particularly in regard to those of the aquatic kind, are very important to them.

They are found in great abundance everywhere on the coast; but the greatest number by far are caught in the few places where they breed. The eggs the Icelanders make use of themselves, as likewise the flesh, which is eaten by a great many of them; but with the feathers and down they carry on a very considerable trade.

It would be unnecessary to mention all the different sorts of birds, especially as there is scarcely any country where so many kinds, and such great numbers of them, are to be met with as in Iceland. Among the great abundance of geese, water-fowls, ducks, &c., &c., I will, however, say something of the Swan and Eider-bird.

It is known that the Swan belongs to the class of birds of passage; their numbers increase very much towards winter, though there is no scarcity of them at any time, as the greater part of the young breed constantly remain there. In spring we may often see an hundred of them in a flock, and frequently many more; and it is then thought that part of them advance yet further to the north, and make but a very short stay in Iceland. During the summer they resort to the lakes; but when winter approaches, and these begin to freeze, they remove to the sea-shores. Their eggs are gathered in the beginning of spring, which are large, and said to be very palatable. In August, when they lose their feathers, they are hunted on the lakes, where they are to be found at that time, with dogs trained to catch them alive. They are said to sing very harmoniously in the cold dark winter nights; but though it was in the month of September when I was upon the island, I never once enjoyed the pleasure of a single song. An old Swan has a fishy taste, but the young ones are reckoned among the best eatable fowls.

The Eider-bird is yet more useful to the natives, who consider it as a kind of treasure; and it is seldom heard that a prudent house-keeper shoots or kills any of them.

The Eider-birds generally build their nests on little islands not far from the shore, and sometimes even near the dwellings of the natives, who treat them with so much kindness and circumspection as to make them quite tame. In the beginning of June they lay five or six eggs, and it is not unusual to find from ten to sixteen eggs in one nest together, with two females, who agree remarkably well together. The whole time of laying continues six or seven weeks, and they are fond of laying three times in different places; in the two first both the eggs and down are taken away, but in the last place this is seldom done. Those to whom one of these places belong visit it at least once a week.

When they come to the nest, they first carefully remove the female, and then take away the superfluous down and eggs, after which they replace the female on the remaining ones, when she begins to lay afresh, and covers her eggs with new down which she has plucked from herself: when she has no more down left, the male comes to her assistance, and covers the eggs with his down, which is white, and easily distinguished from the female's; where it is left till the young ones are hatched, who in an hour afterwards quit the nest together with the mother, when it is once more plundered.

The best down and the most eggs are got during the first of their laying; and it has in general been observed that they lay the greatest number of eggs in rainy weather. As long as the female sits, the male is on the watch near the shore; but as soon as the young are hatched he leaves them. But the mother remains with them a considerable time after; and it is curious to see how she leads them out of the nest as soon as they creep out of the eggs, and goes before them to the shore, whilst they trip after her: when she comes to the water side she takes them on her back, and swims with them for the space of a few yards, when she dives, and the young ones, who are left floating on the water, are obliged to take care of themselves. [This mode of carrying the young to the water is adopted by the Razorbill, Guillemot, and other cliff-haunting birds, and it is remarkable that the Eider Duck should pursue a similar plan, instead of imitating other ducks, which, as a rule, lead their young to the edge of the water, and, entering it before them, encourage them to follow in their wake. It may be observed, however, that when a Wild Duck, *Anas boschas*, nests, as not unfrequently happens, at a height from the ground (as, for example, in a pollard or on the top of a stack), she carries down her young when hatched either on her back between the uplifted wings, or else in her bill.—Ed.] One seldom sees these birds on land afterwards, for they generally live on the damp rocks in the sea, and feed on insects and sea-weeds.

One female, during the whole time of laying, generally gives half a pound of down, which is, however, reduced to one half after it is cleansed. The down is divided into *thang-duun* (sea-weed down) and *gras-duun* (grass-down). The last sort is thought to be the best, and is cleansed in the following manner:—some yarn is streaked in a square compartment round a hoop, on which the down is laid. A pointed piece of wood is then moved backwards and forwards on the lower side of the yarn thus streaked, which causes the coarser feathers to fall through, while the fine down remains on the yarn.

Down plucked from dead Eider-birds is of little worth, because it has then lost the greatest part of its elasticity; for this reason it is of little value in Iceland. The other sort is sold at forty-five fish a pound when cleansed, and at sixteen fish when not cleansed. There are generally exported every year on the Company's account 1500 or 2000 pounds of down, cleansed and not cleansed, exclusive of what is privately exported by foreigners. In the year 1750 the Iceland Company sold as much in quantity of this article as amounted to 3745 banco-dollars, besides what was sent directly to Gluckstadt.

Among the land-birds that are eatable, Ptarmigans are not to be forgotten, and are caught in great numbers. Falcons, also, abound in the island, of which there are three sorts: they are purchased by the royal falconers, who give fifteen dollars a-piece for the white, ten for those that are darker, and seven for the grey.

ON THE SHEDDING OF THE CLAWS IN THE PTARMIGAN AND ALLIED BIRDS.

BY LEONHARD STEJNEGER.*

THE fact of the Ptarmigans shedding their claws regularly every summer seems not to have been observed personally by any of the many excellent American ornithologists, and has therefore been comparatively little known to them. It may consequently not be without interest to demonstrate this process, as I have material at hand which shows the procedure very plainly.

The late Prof. Sven Nilsson, the famous Swedish zoologist, was the first to discover this peculiarity in the Ptarmigans. His countryman, Prof. W. Meves, afterwards confirmed his observations, and at the same time proved that this singular shedding of the claws also occurs in other birds of the family *Tetraonidæ*, as, for instance, in both sexes of *Bonasa bonasia*, *Urogallus urogallus*, and also, in the female at least, of *Tetrao tetrix*.

As will be seen in the specimens of the *Lagopus ridgwayi* (a new species which I was fortunate enough to detect on the Commander Islands, near Kamtschatka), shot in June and August, before shedding, the middle claw measures 18—20 mm., while in a specimen shot on the 23rd of August, and which has just thrown the old ones off, the length of the new claw is only 11 mm. More instructive still is a male, shot on the same day, as it has the claws only partially shed. The old claws have become loosened from their base, and are forced 2—3 mm. out, still covering the tip of the new ones, except on two toes, from which they have already dropped off. Hence it is obvious that the process is not a pathological one, in which the nail drops off as soon as it is perfectly separated from its bed, and has ceased to receive nourishment through the blood-vessels.

Most conclusive, however, is a specimen of a quite different species, *Lagopus albus*, a specimen collected by Dr. Bean, on Unga, one of the Shumagin Islands, Alaska. About this specimen Dr. Bean remarks, in his "Notes on Birds collected in Alaska," &c., in the Proc. U. S. Nat. Mus. 1882 (p. 163), as follows:—"This specimen (shot on July 21st) corresponds very closely in most respects with number 33,548, a female from Norway, collected July 2nd, 1862; the claws, however, are considerably shorter than in the Norway example, and in all other specimens of *albus* in the Museum." Dr. Bean was kind enough to show me the specimen, when it was apparent that the extreme shortness of the claws was due to the fact that the bird had shed them just before it was shot, except on the right outer toe, on which the nail was so loose, however, that it dropped off, as I was a little too rough in handling it.

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* Reprinted from 'The American Naturalist,' vol. xviii. pp. 774—776 (1884).

It will thus be seen that the shedding takes place in July or August, according to locality and other circumstances, at the time when the toes are most denuded—in fact, almost wholly naked—and the dark summer plumage is most complete. The claws grow very rapidly, however, and reach their full length long before the white winter plumage with the densely clothed toes is fully developed.

So far as is known, this process is confined to the members of the family of *Tetraonidæ*, mentioned above, when in the wild state, but Collett, in Christiania, has mentioned a case where a Quail, *Coturnix communis*, shed its claws in confinement, but this may have been due to some pathological process.

I am not aware that this peculiarity has been observed in any of the American *Tetraonidæ*, except *Lagopus albus*, but there seems to be no reason why it should not occur, at least in species living under conditions similar to those in Northern Europe and North-Eastern Asia. It is to be expected that we will soon hear of instances from this Nearctic Region also, when attention has once been directed to it.

No histological investigation has been made to ascertain the causes and the development of this unusual process (at least I am not aware that any results of such an investigation have ever been published), and consequently nothing is definitely known.

As to the use which the birds derive from this extraordinary elongation of the claws, I shall only quote Prof. Meves. He wrote in 1871 [Ofr. Sv. Vet. Acad. Forhandl. 1871, p. 772] as follows:—"They (*Lagopus* and *Tetrao*) have, all through the winter, to struggle with the snow upon which they are forced to walk. The snow is often loose, and with a foot like that of the common fowl they would need much greater exertion of their strength in order to keep themselves on the surface. But as the Ptarmigan, by having the underside of the toes thickly coated with feathers, which can be spread out, and by means of the long and straight claws,—which may be compared with snow-shoes,—are enabled to run easily over the snow, the usefulness and the necessity of the lengthening of the nails is self-evident. In the genus *Tetrao* (= *Urogallus* + *Lyurus* + *Bonasa*) the lateral horny fringes of the toes render the same excellent service, and may fitly be regarded as a kind of snow-shoes. *During the summer this whole outfit becomes superfluous*, which may be the main cause of the periodical shedding." It may in this connection be mentioned that the horny fringes in Tetraones, and the thick feathers of the toes in Lagopodes, also moult during the summer, at which time the toes of the latter are almost wholly denuded of feathers.

NOTES AND QUERIES.

MAMMALIA.

Northern limit of the range of the Noctule in Great Britain.—In 'The Zoologist' for May (p. 170) attention was directed to the statement in Bell's 'British Quadrupeds' (2nd ed. 1874, p. 23) that the northernmost locality from which specimens of *Vesperugo noctula* have been received is Northallerton in Yorkshire, and it was suggested that the species named *V. serotinus* by Messrs. Mennell and Perkins in their 'Catalogue of the Mammalia of Northumberland and Durham' was more likely to be *V. noctula*. The specimen in question has been fortunately preserved in the Newcastle Museum, and both Mr. W. D. Roebuck and Mr. T. Southwell, who have examined it, agree in considering it to be undoubtedly *V. noctula*. The range of this species northward is therefore considerably extended beyond the limit assigned to it by Bell, and its occurrence in Durham, where the specimen in question was procured, has since been confirmed by the capture of another example in the same county, as reported by Mr. T. H. Nelson. Writing on this subject so recently as the 12th May last, Mr. Roebuck says:—"Referring to your remarks at p. 170 of 'The Zoologist' for May, I may mention that when in Newcastle in November, 1884, I was careful to examine the specimen which Mennell and Perkins recorded as *V. serotinus* in their 'Catalogue of the Mammalia of Northumberland and Durham,' and I came to the conclusion that it was a Noctule, although the specimen had lost its colour and was much bleached. This view was apparently shared by Mr. Howse, the Curator of the Museum, and I believe also by Mr. Southwell, who drew my attention to the existence of the specimen, on hearing that I was about to visit Newcastle. I recorded my observations in 'The Naturalist' for April, 1885 (p. 202). It was taken in 1836 at Mr. Swinburne's house, between Harton and Cleadon, in Durham county, not far from Newcastle-on-Tyne. This occurrence is of interest as being the most northerly record for the Noctule, a species which is generally distributed and not uncommon in Yorkshire." Mr. Roebuck's remarks in 'The Naturalist' for 1885 (p. 202), to which allusion has been made, are as follow:—"In the Newcastle Museum there is a specimen of a Bat which was taken in the year 1836, at Mr. Swinburne's house, between Harton and Cleadon, in the county of Durham, and not far from Newcastle. It was recorded among the donations to the Museum as the Serotine, 'A species of Bat (*Vespertilio serotinus*), taken near Cleadon; Mr. A. Swinburne, 1836' (Trans. Nat. Hist. Soc., 4to, vol. ii.) It also figures as the Serotine in Messrs. Mennell and Perkins's 'Catalogue of the Mammalia of Northumberland and Durham.' The identification is, however, incorrect. Mr. Thomas Southwell, of Norwich, visited the Museum last year, and, after such inspection as can be given to a specimen in a closed glass case, considered it to be in all probability a Noctule (*Vesperugo noctula*). He wrote me to this effect in September. When, therefore, I visited Newcastle some weeks after, I was sufficiently interested to make inquiries on the subject, and found that Mr. Richard Howse, the Curator, had investigated the subject, and shared Mr. Southwell's view. He also showed me the specimen, and, after examination, I fully coincided in their opinion. The specimen is old and much bleached from exposure to light, but it seems to present all the external structural characters of the Noctule. The settlement of the correct name of the specimen is of interest from a geographical point of view from its being a northward extension of the range of the Noctule, which has not before been satisfactorily recorded for any locality north of the River Tees. Why it should not occur—and commonly, too—in the county of Durham is an enigma, for it is not only widely diffused throughout Yorkshire, but is a common species in that county." In a subsequent communication to the same periodical ('Naturalist,' 1886, p. 113), Mr. Roebuck remarked:—"The following item from the 'Durham County Advertiser,' February 26th, 1886, evidently refers to *Vesperugo noctula*, and is therefore of interest in view of the fact that Durham county forms the northernmost limit of its range. In the Duke of Cleveland's timber-yard in Winston Lane, near Barnard Castle, squeaks were heard while a workman was cross-cutting the trunk of a large oak near the roots. On the crevice being opened twenty-five 'rat bats' were found in a cluster.

The species is the largest known in this country. These measured, from tip to tip of the wings, from eight to ten inches, and the only sign of life was the exhibition of formidable teeth. Put into a cage and warmed they became animated, and were set at liberty." Supplementary to this notice, Mr. T. H. Nelson added the statement (*tom. cit.* p. 173) that Mr. C. E. Morgan, of the Flats, near Bishop Auckland, shot a Noctule while flying over the pond at the Flats during the summer of 1885. It remains to be ascertained whether any confirmation can be obtained of the reported occurrence of this species in Scotland.—J. E. HARTING.

Food of the Greater Horse-shoe Bat.—I send you some wings of Lepidoptera for identification from "the larder" of the Greater Horse-shoe Bat. The insects must have been captured on the wing or snatched off the leaves of trees (as is the habit of the Long-eared Bat), and after being carried to the captor's retreat (a cave near Tavistock) the wings, on being bitten off, fell to the ground, where they were picked up.—A. H. MACPHERSON (3, Kensington Gardens Square, W.).

[We have counted thirty-six wings belonging to four species of moth, namely, the Common Yellow Underwing, *Triphæna pronuba*, the Broad-bordered Yellow Underwing, *Triphæna fimbria*, the Pearly Underwing, *Agrotis saucia*, and the Herald Moth, *Scoliapteryx libatrix*. It seems a little curious that such large insects should be taken by so small a mouth, but the wings being clipped off, the bodies no doubt would be easily disposed of.—ED.]

Small Rorqual at Plymouth.—On May 16th a young female Lesser Rorqual, *Balænoptera rostrata* (Fabricius), was exhibited by some fishermen about the streets of Plymouth in a cart. It had been taken entangled in a mackerel drift-net by the Lowestoft fishing-smack 'Blue Bell' the previous week. The following are some of its dimensions:—Total length, from centre of tail to point of upper jaw around curve, 12 ft. 7½ in.; the mouth was propped open, but the men said the lower jaw projected four or five inches beyond the upper when closed, making it then fully 13 feet long; length of gape, 3 ft. 1 in.; width across mouth at gape, 1 ft. 9 in.; length of eyelids, 3 in., the eye being placed just above the angle of the gape; from point of snout to insertion of flipper, 3 ft. 4 in.; length of flipper, 1 ft. 10 in.; width of ditto, 6 in.; from point of snout to insertion of dorsal fin, 6 ft. 4 in.; width of dorsal fin, 8 in.; length of ditto, 8 in.; width of caudal fin, 3 ft. 1 in.; blowholes, two longitudinal slits 4 inches long and close together, situated at 1 ft. 8 in. from point of snout. The whalebone was only a few inches long, of a pale flesh-colour, fringed with whitish hair. The flippers were traversed by the white band which is distinctive of this species. The weight was estimated at 17 cwt. I have secured the skull and cervical vertebræ for the Museum of the Plymouth Institution. The butcher who cut it up said that the gullet was not larger than that of a calf, and far too small to swallow a mackerel.—F. H. BALKWILL (3, Prince's Square, Plymouth).

BIRDS.

A Puffin in London.—On May 20th I received the skin of a Puffin, *Fratercula arctica*, which, strange to say, flew into one of the bedrooms of the house No. 45, Brook Street, Grosvenor Square, on the 16th of that month. It was alive when found, and the owner of the house, Sir John Walrond, Bart., had it killed, and presented it to a lady, who kindly forwarded it to me. It is curious that I rented this very house in the winters of 1884–5 and 1885–6, and no more distinguished visitor than a stray House Sparrow ever favoured me with a visit there.—LILFORD.

[From the nature of its haunts, and its strictly oceanic habits, the Puffin is one of the last birds one would expect to meet with in the Metropolitan county. Graves, in vol. ii. of his 'British Ornithology,' mentions the capture of a Puffin on the Thames, near Chelsea, in 1812, remarking:—"We are at a loss to conceive by what unaccountable accident this bird should have wandered so far from the coast, as the nearest place to which the species is known to resort is the cliffs at Dover."—ED.]

Puffin on the Thames in July.—I have in my collection a specimen of the Puffin, *Fratercula arctica*, which was shot on the Thames between Erith and Gravesend on June 12th, 1885. The beak of the bird is very abnormally shaped.—RILEY FORTUNE (Harrogate).

[See an article on the moult of the bill in the Puffin, published in 'The Zoologist' for July, 1878.—ED.]

The Missel Thrush occasionally a Bird of Prey.—During the dry weather which prevailed this spring, with easterly winds, I one day saw a Missel Thrush fly up to the nest of a common Song Thrush, take out a young one and carry it off to her own nest and feed her young ones with it. How she broke it up I could not see, but she appeared to be pecking it to pieces; and she continued her visits to the Song Thrush's nest until she had carried off every one of the four young birds which it contained. The old Song Thrushes made a great outcry while this was going on, which attracted my attention to the spot. I may add that the young Missel Thrushes were nearly fledged, and the young Song Thrushes only just hatched.—E. A. SANFORD (Nynehead Court, Wellington, Somerset).

Kestrel and Slow-worm.—My keeper's attention was recently directed to a small patch of gorse by a Blackbird's cry of alarm announcing the vicinity of some foe. He cautiously approached the spot, and found himself within a couple of yards of a male Kestrel in the act of dealing deadly blows upon the head and neck of a slow-worm, whose detached tail was wriggling about on the grass a few inches off, in contrast to the body, which lay distended and motionless. The Kestrel was unaware of the keeper's presence until after an interval of some minutes, which gave him the opportunity of leisurely witnessing the scene. So precipitate was this bird's flight when it eyed the keeper that it did not give itself time to snatch up either the body or the tail-end of the Slow-worm, but went away empty-clawed. Such precaution was needless, as all winged "vermin" (Sparrowhawks excepted) enjoy full immunity here. They are all allowed to live and multiply. I sent for the remains on the day following, and on examination I found the upper parts of the head and neck had four deep wounds, each of which was sufficient to cause death. The broken extremity showed no marks of violence. It is possible the occurrence may have taken place through the natural contraction of the muscles and body, as occasionally happens, and from which habit it obtains the specific name of *fragilis*. The tail end, which the keeper was unable to find, had been taken away possibly by the Kestrel, which had a nest in the neighbouring covert. The length of the Slow-worm was thirteen inches.—J. C. MANSEL-PLEYDELL (Whatcombe, Blandford).

Nesting of the Marsh Warbler in Gloucestershire. — After the repeated occurrence of the Marsh Warbler (*Acrocephalus palustris*) at Taunton and at Bath, it is not surprising that it should turn up a little further north; and I have the pleasure of recording its nesting near Cirencester, in this county. The bird itself has not been noticed, but a nest was found about the middle of June, 1886. The finder was a son of Mr. Henry Plummer, farmer, of Liddington, near Cirencester, who cut out the nest, which contained five eggs. Working alone and without books on the subject, he had no idea of the prize he had found, until my attention was drawn to it recently. Two of the five eggs were sent me for comparison, and are of the common type of Marsh Warblers; indeed, but for the difference before blowing, I could hardly have picked them out again if once mixed with my stock of continental specimens. I have since visited the spot where they were taken, seen the other three eggs, and obtained the nest, which Mr. Plummer kindly gave me. It is about four inches in diameter externally, and barely three inches deep; the cup two inches in diameter, by one inch and three-eighths deep. It is composed almost entirely of fine roots and grass, with a few hairs in the lining, and one or two bits of wool and dead leaves outside. It was situated about three feet from the ground, and partly suspended from the lower shoots of a small elder bush and the undergrowth around it. This elder bush is one of several stunted bushes scattered through a long narrow withey bed on the bank of the Thames and Severn Canal. When I visited the spot a week ago, my companion found in close proximity a Reed Warbler's nest just completed, and a Reed Bunting's, containing four fresh eggs. The immediate neighbourhood I should consider highly suited to the species, on one side being the almost disused Thames and Severn Canal, and, a few hundred yards off, the Thames, here a mere brook, having its source at Seven Springs, near Cheltenham, some fifteen miles to the north. The space between canal and brook is almost entirely occupied by meadows, with irrigation-ditches running over their surface. It may save trouble and disappointment if I state here that the above eggs are not for disposal. Mr. Plummer naturally desires to keep the three he has; the other two were given by him to Mr. Alfred Archibald, of Cirencester, through whose kind offices I was made aware of this interesting addition to our county avifauna.—H. W. Marsden (37, Midland Road, Gloucester).

Unusual Nesting-site for the Tree Sparrow. — On May 24th, whilst examining some exposed mole-burrows (many of which had been deepened or adopted by Sand Martins), in a brick-earth cutting at Kemsley, near Sheppy, I observed proofs that one of the larger holes had been taken possession of by some birds; in fact, at my approach a Tree Sparrow flew out almost in my face: on digging away the surface of the earth I exposed a nest lined with white feathers, and containing six perfectly typical eggs. It is well known that Tree Sparrows in this country usually select pollard willows as nesting sites, the nest being frequently placed in a hole between the young branches of the partly-decayed trunk; I have also found the nest in a hole in a large dead branch which had been cut off near to the trunk. —A. G. Butler (Natural History Museum).

Hawfinch nesting in Surrey. — On May 30th a nest of the Hawfinch (*Coccothraustes vulgaris*) containing eggs was found in the Leith Hill district of Surrey; the exact locality perhaps it is unnecessary to mention. The nest was built in the fork of an apple tree, about ten feet from the ground. Another nest of this bird was found here last year, but I am afraid it was robbed.—David J. Rice (Coldharbour, near Dorking).

The "Grouse Disease." — Having lately had the opportunity of examining several dead grouse which were said to have died of the "grouse disease," I have been led to certain reflections which may possibly be of interest to your readers. I may divide the grouse fully examined into three groups:—(A). Two specimens examined on the 30th of last September, which were found dead on a moor in Yorkshire. These specimens were fairly nourished, exhibited no sign of disease, and had apparently no other parasite than the common tapeworm; the organs of these worms gave no indication of the cause of death. (B). One of several specimens sent from Ayrshire was particularly examined; in fair plumage, without marked signs of starvation, and with a well-filled crop, this bird showed an inflammation of the walls of the intestine of so marked a character, that—as I wrote to the Editor of 'Land and Water,' from whom I received the specimen—the cause of its death should be the study of a professed pathologist; tapeworms were again found in the intestine. (c). A grouse received on May 24th from Sir W. Wallace, on whose moors the deaths have been terribly numerous, was in an extreme state of emaciation; its crop contained but three tops of heather, its liver was congested, and the contents of the intestine particularly fluid; tapeworms were present in rather stronger force than usual, and in the cæca I found the threadworm which was regarded by Dr. Spencer Cobbold as the cause of "grouse disease." Of A, then, it can only be said that they were dead; of B, that it was suffering from inflammation of the intestines; and of C, that it was starved, and contained Cobbold's worm. If, then, all three grouse died of "grouse disease," grouse disease must kill in at least three different ways, or under the term "grouse disease" more than one affection is included. The latter would appear to be the more reasonable supposition, and in that case it may be pointed out that the first thing to be done is to define much more strictly than has been done in the past what is meant by "grouse disease"; of all these birds, strict accuracy forbids our saying more than "they were dead." I have, however, been told more than once that there is a certain external diagnostic sign of the disease, and that is the loss of feathers from the feet; on that I should like to make two remarks. One follows the natural history of the group, and may be most briefly expressed in the words of Dr. Stejneger ('American Naturalist,' 1884, p. 776), "the thick feathers of the toes in Lagopodes also moult during the summer, at which time the toes of the latter are almost wholly denuded of feathers." [The article here quoted is of such interest to ornithologists that we have thought well to reprint it in the present number.—Ed.] The other remark is, that a Ptarmigan, in which the denudation of feathers on the feet has gone on to a considerable extent, was examined by me this morning, and was found to be perfectly healthy, well-nourished, and free from helminth parasites. I conclude, therefore, that the loss of feathers from the feet is not, at this season of the year, to be taken as a diagnostic sign of any diseased condition of the bird. I cannot avoid the conclusion that the birds examined by me did not in any case primarily owe their death to helminth parasites; examination on the spot will best decide whether microbes play a part in the ætiology of the disease or diseases which are now causing such havoc in S.W. Scotland.—F. Jeffrey Bell.

Hybrid Greenfinches.—Three more hybrid Greenfinches, in addition to those already recorded (Zool. 1883, p. 379), are worth mentioning, as proving the frequency with which this hybridism takes place in a wild state. The first of these was caught at Yarmouth in 1882, and may be seen stuffed and cased in the house of one of the birdcatchers there. It was noticed by Mr. G. Smith soon after being taken, and he agrees with me in considering that it is a hybrid between a Linnet and a Greenfinch, closely resembling Mr. Stevenson's hybrid (Zool. *l. c.*) of similar origin. The second was sent alive to my father on the 15th November last from Cambridge, by Mr. F. Daggett, who states that he is quite familiar with this kind of hybrid from having obtained similar examples. This bird seems to be a male, like the Yarmouth one; it has the Linnet's head, but with rather a stouter beak than a Linnet; the colour of the head and neck is like a Linnet's, but the wings and tail are more like those of a Greenfinch. It is slightly darker than Mr. Stevenson's bird, and of rather a stouter build. The third specimen, which is also apparently a male, was caught with some Siskins at Taverham, near Norwich, on the 15th December last. It is a much yellower and more slender bird than the Cambridgeshire example, and in fact shows no colouring which can with certainty be assigned to the Linnet. In the opinion of its owner it is a hybrid between a Greenfinch and a Siskin. An instance of such a hybrid in captivity has been reported by the Rev. H. A. Macpherson (Zool. 1883, p. 339). I hesitate to express an opinion about it, but incline to think it is what the owner supposes. It must be borne in mind that the colour of the plumage in hybrids is not always a certain indication of parentage; this has been proved more than once in the case of hybrids bred in confinement, whose parents were known; but as the bird in question was caught with some Siskins there seems nothing improbable in the assumption that a Siskin was one of its parents. That the other parent was a Greenfinch is evident. I may add, for the benefit of those interested in Hybrid Finches, that a paper on the subject by Mr. Macpherson will appear in the forthcoming number of the 'Transactions of the Norfolk and Norwich Naturalists' Society,' in which every cross known to have bred in confinement will be noticed, with other particulars. — J. H. Gurney, Jun. (Keswick Hall, Norwich).

Plover's Nests with five Eggs.—Plovers' nests containing five eggs are of sufficiently rare occurrence to be noticed, and amongst the large number of nests I have come across I have only found two with more than four eggs. One last year had five, all of which were of the same ground-colour, and the markings were so much alike that I am perfectly satisfied they were all laid by the same bird; the fifth egg was smaller than the others. Last week I found a second nest containing five eggs, four of which were long-shaped ones, rich dark cream-colour, with large dark blotches; the fifth was pear-shaped, very thick at the larger end, and with a paler ground colour and small spots. This egg was no doubt (as often happens) laid by a different bird.—J. Whitaker (Rainworth Lodge, near Rainworth).

Jackdaw taking possession of Magpie's Nest.—On May 9th, whilst walking through a wood, I saw a Jackdaw leave what appeared to be a newly-built Magpie's nest, at the top of a tall larch-fir. Having ascended the tree I found four eggs of the Jackdaw in the nest, which had evidently been built by Magpies this spring. The Jackdaws had much enlarged the hole in the roof, and had lined the nest according to their own ideas. About half a mile away another pair of Magpies have been ejected by a pair of Kestrels: this happened before the nest was completed.—E. W. H. Blagg (Cheadle, Staffordshire).

Thrush's Nest without the usual Lining.—When birdnesting last week I found three Thrush's nests lined with grass instead of rotten wood; they all contained eggs, and were well made and much thicker than usual. I have seen many hundreds of Thrush's nests, but never one like these. If they had been on a moor, or in a town garden where rotten wood was scarce, I should not have been so much surprised, but they were in a wood of eight hundred acres, where abundance of the usual lining-material might be found.—J. Whitaker (Rainworth, near Mansfield).

Habits of Rooks.—In 1885 my brother, Mr. J. S. B. Borough, reared a young Rook, which had fallen or been blown from a nest in the rookery in the park here. The freedom of this bird had never been in any way interfered with, but he is very tame with the few persons with whom he is on intimate terms, and rarely has missed coming daily to be fed in the outhouse in which he was reared. Last year we had every reason to believe that he nested and had a nest in the rookery in the park where he was hatched. This year, however, he and his mate belong to the thirty-six pairs or so which form the rookery round the house, and they built a nest in the smaller of two contiguous elms. I ought to say here that my brother and I know this tame bird when on the wing by a slight space about midway in his left wing, and on the perch by a small division in his tail-feathers, which prevents the tail from presenting the usual evenly rounded appearance. On April 11th my brother noticed that his bird carried food to and fed a bird sitting on a nest in the larger elm. He had also previously observed him carrying sticks to a nest other than his own. Since that day—which was I presume one of the first on which his second hen began to sit—the tame bird has fed both the sitting birds, as a rule, but not invariably, alternately. Yesterday (April 17th) I watched the two nests from 10 a.m. to 1.10 p.m., noting down all that occurred. During that time I observed that the tame bird fed his mates twelve times. His earlier mate, in the smaller elm, he fed seven times and the other five times. On four occasions certainly, and possibly on more, he took food—*i. e.*, raw meat or bread and milk—from the outhouse in which he is usually fed, but on one occasion I watched him fly into the meadows and return with a pouch full of food in a quarter of an hour's time. No other bird fed the two sitting hens or either of them during the whole of this time. On each occasion of his feeding them I identified our bird as he arrived or departed. The above facts show, I think, that this tame Rook is polygamous or rather bigamous I suppose that the "high living" which he has always enjoyed, and the ease with which he can procure food enough to satisfy two mates and himself, has caused him to undertake a task which would probably prove too much for the strength and food-providing powers of birds subject to natural conditions, and which is therefore seldom or never undertaken by them.—C. R. Gawen (Chetwynd Park, Newport, Shropshire).

Young Dippers taking to the Water.—On April 11th I found a nest of the Dipper, *Cinclus aquaticus*, under a bridge near Chard. Some time afterwards, on my brother visiting the spot, one of the young ones deliberately dived from the nest, which was in the crown of the arch, and swam to the other end, a distance of several yards, and then landed and sat on the bank as if nothing had happened. As there seems to be some doubt whether Dippers readily take to the water or not this observation may perhaps be of interest to your readers.—A. H. Buckland (4, East Street, Taunton).

Swallow in Somersetshire in December.—In 1885 I saw a Swallow on the down at Clifton, close to the river, in December. It was before the 7th—and I think on the 3rd—of that month. It was a clear day, and though there had been a sharp white frost the night before, there were a good many gnats about.—E. R. Clutterbuck (Monks, Corsham, Wilts).

Cream-coloured Courser in Cardiganshire. — A specimen of the Cream-coloured Courser, *Cursorius isabellinus*, was shot by me on the 2nd October last, at Ymyslas, near Borth, Cardiganshire, on the estuary of the Dovey. As the skin has been seen and identified by Mr. Nelson, of Bishop Auckland, and Mr. Nicholson, of Manchester, there can be no doubt about the species.—A. Hooton (Kersal Towers, Higher Broughton, Manchester).

Food of the Spotted Flycatcher.—In Latham's 'General History of Birds' (vol. ii. p. 323) I find the following remarks on the Spotted Flycatcher:—"This species frequents orchards where cherries grow, of which they are said to be very great destroyers. Hence in Kent are known by the name of cherry-suckers." Can any of your readers confirm this statement? I have always considered the Flycatcher to be, as its name implies, an insectivorous bird.—William E. Beckwith (Eaton Constantine, Ironbridge, Salop).

Norfolk Plover nesting in Nottinghamshire.—Within a few fields of this house, I am delighted to say, a pair of Norfolk Plovers, *Œdicnemus crepitans*, are nesting this year, and the owner of the farm they are on is taking every care that they may not be disturbed. I am glad to say a pair reared their young there last year.—J. Whitaker (Rainworth Lodge, near Mansfield).

Autumnal Migration of Birds at Teesmouth.—By the middle of October (1886) the autumn migration was in full swing; Larks, Goldcrests, Blackbirds, and most of the regular winter migrants were constantly arriving. The first Fieldfares were seen on the 9th, Woodcock on the 11th, and Short-eared Owl on the 16th; while Hooded Crows were very late with us; I did not observe any until the 20th—generally they arrive during the first week of October. On the 14th, while out in a boat, I noticed great numbers of sea-birds—Gulls, Gannets, Skuas, Guillemots, and Razorbills. The Gulls were principally Kittiwakes, *Larus tridactylus.* Guillemots and Razorbills passed continuously to the south-east in small flocks of from three or four to fifteen or twenty, and all around us for miles we could see birds flying. Amongst others we shot an adult Gannet, three Richardson's Skuas, *L. parasiticus* (one adult and two immature), and a male Great Skua, *L. cataractes.* The last named is a rare bird in this district; Mr. Mussell, the birdstuffer at Redcar, tells me he has never before had one through his hands. It is many years since there was such a remarkable abundance of bird-life off Redcar; I never before remember having seen such a number and variety of species at one time. Several of the fishermen said they had not seen so many Skuas since the great flight on October 14th, 1879—just seven years previously. I saw one Pomatorhine Skua, and the next day several of these birds were flying over the rocks before a south-east gale. It is quite probable that the commotion amongst the birds at sea might be attributed to the impending storm: the Guillemots, particularly, seemed to be in great haste, hurrying away as though for dear life. I have frequently noticed that sea-birds seem to possess a remarkable instinctive knowledge of approaching change of weather, and there is a great deal of truth in the saying that "To be a successful wildfowler a man should be also a weather prophet." On October 15th, a strong south-east gale blowing, many Gulls and Skuas passed over the rocks to the north-west, as also a few Ducks; and, on the same day, I saw a large flock of Green Plover crossing from seaward and flying high to the south-west. On the 16th a Red-throated Diver, *Colymbus septentrionalis,* with part of the red-throat patch remaining, was shot off East Scar. On the 18th the wind was strong from the north-east, with heavy rain, and several Velvet Scoters, *Œdemia fusca,* were swimming outside the breakers; two rose and flew past over the sands, when I secured one of them. In the afternoon I shot another Velvet Scoter from Redcar Pier; it came ashore with the flowing tide, and proved to be a young male. On the 19th it was still stormy; Ducks, Larks, Woodcocks, Owls, Goldcrests and other small birds, crossed in considerable numbers. In the afternoona young male Scaup was shot near the pier. On the 20th great numbers of Hooded Crows and Larks crossed. On the 21st, at West Scar, I secured a young male Long-tailed Duck, *Harelda glacialis.* On the same day two female Long-tails were shot at East Scar. Hooded Crows and

Ducks passed during the morning. On the 22nd there was a great rush of Larks all day, and a few Hooded Crows. On the 23rd I saw a Great Northern Diver, *Colymbus glacialis*, outside Salt Scar, but could not get within a hundred yards of it. In the early part of November, Mr. A. E. Pease, M.P., killed a female Goosander, *Mergus merganser*, in a small runner near Guisbro', and about the middle of the month Mr. R. F. Chilton shot a large female Great Northern Diver at the Tees-mouth. Mr. Chilton informed me that it weighed close upon twelve pounds, which I can quite believe, judging from the size of the bird. There has evidently been a flight of Shore Larks, *Alauda alpestris*, on the coast. Twelve or fifteen were killed during the first week in December; on the 10th two more were shot on Coatham sands, and on the 11th Mr. Emerson shot three at the same place. I examined ten or a dozen examples, and found all of them to be young birds.—T. H. NELSON (North Bondgate, Bishop Auckland).

Food of the Smew.—It is generally admitted that all the Mergansers subsist chiefly on fish, and such has hitherto been the writer's experience. Smews, in particular, almost always contain remains of small fishes, less frequently aquatic insects; and though the diving ducks often yield on dissection no further results than a few small pebbles, the Smews are rarely obtained when fasting. On a recent occasion a Smew proved to have eighteen minnows in its gullet, while the stomach contained the remains of others. It may therefore be worth while to record that a Smew of the year, purchased in Leadenhall on March 25th, contained no remains of animal food, but the stomach held a small quantity of digested vegetable matter. An adult opened a month earlier contained a small eel, which was quite intact.—H. A. MACPHERSON.

The Ancestry of Birds.—If birds are developed from amphibians or pre-amphibians, and if Prof. Huxley is right, as I believe he is, in supposing that the connection of mammals with amphibians is neither through reptiles nor birds, we come to this: that amphibians or pre-amphibians have furnished the common stem whence reptiles, birds, and mammals have diverged. In that case there is an end of that group, "Sauropsida," which the birds are alleged by Prof. Parker to "culminate." But, further, amphibians are certainly more closely allied to reptiles than to either birds or mammals. Cuvier's system may therefore be justly reverted to, and the Amphibia or Batrachia be considered as the lowest division of the Reptilia, which I do not for one moment doubt is the true classification.—*Prof. Cleland in 'Nature.'*

REPTILES.

Colour and Size of Adders.—Is there any truth in the assertion, which I have often heard, that the colour of Adders depends upon the kind of soil on which they live? I am disinclined to accept this theory, as

I have seen Adders of very different colour living on the same kind of soil, and have seen them killed within a few yards of one another. I am speaking of the country about Dorking and Leith Hill, and there I used to see them of various colours—dull yellowish brown, with the dorsal spots dark brown; lighter yellow, with red spots; reddish grey, with red spots; very light greenish grey, with black spots; and some almost black all over. I never saw the handsome dark red variety. As far as I can recollect, they have all red-coloured eyes. I should much like to know the size that Adders have attained to. The largest I killed, and which I measured before it was quite dead, was 26 inches, and I saw two others killed about the same time and place, which were both 24 inches. These sizes are undoubtedly above the average, but I fancy that considerably larger ones have been obtained. The 26-inch one was dull yellow, with dark brown spots, and on being captured gave out a strong smell, which fact I have never seen alluded to in any book. One of the other two was a little darker in colour than the one just described, and the other was very light grey, with jet-black markings, just out of his old skin, and one of the handsomest I ever saw. When the yellowish red ones are "clean moulted" they look very like a gold bracelet, when coiled up, basking in the sun. I kept some alive for several months, and tried to entice them to eat with all sorts of dainties, such as small frogs, mice, young birds, slugs, lizards, and bread-and-milk; these—with the exception, of course, of the last-mentioned dish—I used to give them alive, but they refused everything except two unhappy lizards. These they certainly ate, although I did not witness the operation. I kept them in a large box, with perforated zinc in the sides and a sliding glass top; sand, stones, and moss inside. I used to let them out to have a run occasionally, and always picked them up by their tails to put them back into their box. When carried by the tail they are harmless, as they are unable to curl up to reach the hand, although they make strenuous efforts to do so. But I should be very sorry to attempt to pick up by the tail a wild Adder without first pinning him to the ground with a stick on his neck. Referring back to the Lizards which I gave them, I observed that they evinced signs of great terror on being introduced to the Adders, rushing about frantically in all directions, as if they very well knew what an Adder was; and I have no doubt that they are constantly preyed upon by Adders in a wild state. I hope that this will be borne out by others who have studied these interesting, and to my mind handsome, creatures, as I have not yet seen anything but mice reported as their food. In catching Adders on the move with a forked stick, one must aim well forward, or a clean miss will be the inevitable result. They can be carried home dangling to a string tied round their necks.—G. E. Lodge (5, Verulam Buildings, Gray's Inn).

FISHES.

Lumpsucker on the Welsh Coast.—The occurrence on this coast of the Lumpsucker, *Cyclopterus lumpus*, may be worth recording. Two examples were washed ashore, about the middle of May, in the Traeth back, a tidal estuary near Port Madoc. The smaller of the two, which appeared quite fresh, measured about thirteen inches in length. The other was considerably larger, but much damaged by sea-birds. A specimen of the Sea Wolf, *Anarchicas lupus*, about three feet long, said to have been taken off Barmouth, was obtained from a fishmonger at Port Madoc in May. I have not met with either of these fishes before on this coast, and believe they are not common here.—G. H. Caton Haigh (Aber-iâ, Penrhyndendraeth, Merionethshire).

INSECTS.

Bees occupying Birds' Nests.—The occurrence mentioned by Mr. A. H. Buckland (p. 238) I do not think is very uncommon. I have frequently found birds' nests thus tenanted. Occasionally the nests have been new ones, but in these cases I have no doubt that they had been robbed and deserted by the birds previous to the bees taking possession. The nests I have usually found thus inhabited have been those of the Meadow Pipit, Hedgesparrow, and Robin, and, on one occasionally only, a Wren's.—Riley Fortune (Alston House, Harrogate).

SCIENTIFIC SOCIETIES.

Linnean Society of London.

April 7, 1887.—Wm. Carruthers, F.R.S., President, in the chair.

The following gentlemen were elected Fellows of the Society:—Mr. Hunter J. Barron, Mr. James H. Dugdale, and Mr. Edward B. Poulton.

A series of photographs, taken instantaneously from life, of the White Stork, *Ciconia alba*, were exhibited by Mr. Edward Bidwell. These had been executed in Germany, and most accurately represented the birds during the breeding season. Not only were the nests, young thereon, and old birds well shown, but the remarkable attitudes assumed preparatory to alighting and commencing flight, as well as the peculiar twist of the neck in calling, &c., were most instructive.

Dr. Francis Day showed and described some malformed Trout in an early stage of development.

An important botanical paper on the Gentians was read by Prof. Huxley.

April 21, 1887.—Wm. Carruthers, F.R.S., President, in the chair.

Mr. W. Isaac Spencer was elected a Fellow of the Society.

Mr. Patrick Geddes read a paper "On the Nature and Causes of Variation in Plants and Animals." The fact of organic evolution is no longer denied, but its physiological factors have not yet been adequately analysed. Even those who regard natural selection as at once the most important and the only ascertained factor of the process admit that such an explanation being from the external standpoint—the adaptation of the organism to survive the shocks of the environment—stands in need of a complementary explanation which shall lay bare the internal mechanism of the process,—*i. e.* not merely account for the survival, but explain the origin of variations. The relative importance of the external and internal explanation will moreover vary greatly in proportion as variations are found to be "spontaneous,"—*i. e.* in some given direction continuously. Avoiding any mere postulation of an inherent progressive tendency common to both pre- and post-Darwinian writers, the definite analysis of the problem starts with that conception of protoplasm which is the ultimate result of morphological and physiological analysis,—*viz.* to interpret all phenomena of form and function of cells, tissues, organs and individuals alike in terms of its constructive and destructive ("anabolic and katabolic") changes. While the external or environmental explanation of evolution starts with the empirical study of the effect of human selection upon the variations of animals and plants under domestication, the internal or organismal one as naturally commences with the fundamental rhythm of variation in the lowest organism in nature. It also investigates the nature of the simple reproductive variation upon which the origin of species as well as individuals must depend, before attempting that of individual variation. The interpretation of all the phenomena of male and female sex as the outcome of katabolic and anabolic preponderance is shown largely to supersede the current one of sexual selection, and in some cases at least that of natural selection; *e. g.* the specially important one of the origin of such polymorphic communities as those of ants and bees. In such cases natural selection acts not as the cause of organic evolution, but as the check or limitation of it, and acquires importance rather as determining the extinction than the origin of species. The process of correlation, especially that between individuation and reproduction is mooted by the author, and its application to the origin and modification of flowers, &c., outlined. A discussion is given of the embryological and pathological factors of internal evolution, with an outlined application of the whole argument to the construction of genealogical tree of plants and animals.

A report was read "On the Gephyreans of the Mergui Archipelago," by Prof. Emil Selenka, of Erlangen; this communication, dealing chiefly with a technical description of the species, a few being new.

May 5, 1887.—Wm. Carruthers, F.R.S., President, in the chair.

Mr. Ernest W. Forrest and Mr. George Perrin were elected Fellows; Mr. W. Hadden Beeby, Mr. Adolphus H. Kent, and Mr. J. Medley Wood (Natal) were elected Associates; Prof. Dr. Geo. Aug. Schwenfurth of Cairo, Prof. Count Hermann Solms-Laubach of Gottingen, Dr. Franz Steindachner of Vienna, M. le Dr. Melchior Treub of Buitenzorg, Java, and Prof. Dr. Augustus Weismann of Freiburg, were elected Foreign Members of the Society.

The Auditors elected to examine the Treasurer's accounts were Mr. F. Victor Dickins and Mr. George Maw on behalf of the Fellows, and Mr. J. Edmund Harting and Mr. A. D. Michael to represent the Council.

Mr. J. R. Willis Bund exhibited specimens in spirit of the Rainbow Trout, *Salmo iridens*, which had been reared at the Hatcheries of the Fish Culture Establishment at Delaford Park. He pointed out the great difference in size of members of the brood which were of the same age, having been reared from eggs of the same batch. He mentioned that circumstances tended to show that it was a migratory fish, hence as such the value of its introduction into this country as a Stream Trout would be materially diminished.

A Report on the Alcyonaria and Gorgoniæ of the Mergui Archipelago, by Stuart O. Ridley, was read, and in which a number of new forms were described. The author states that, looking at the Alcyonarian fauna of the Burmese coast generally, we find that it is in no way behind that of any other part of the Indian Ocean so far as known. Judging from the present collection, it would seem to be rich in the soft fleshy Alcyonid section—e. g. *Spongodes* and *Lobophyton*, &c.—while the Gorgonias are also fairly represented in new species, and one new member of the family *Melithæidæ* is now added, viz. *Mopsella planiloca.*—J. Murie.

Zoological Society of London.

May 17, 1887.—Prof. W. H. Flower, LL.D., F.R.S., President, in the chair.

The President read some extracts from a letter which he had received from Dr. Emin Pasha, dated Wadelai, November 3rd, relating to some skulls of the Chimpanzee from Monbottu, to some portions of the skeleton of individuals of the Akka tribe, and to some other objects of natural history which he had forwarded (*via* Uganda) to the British Museum of Natural History.

Mr. A. Thomson exhibited some specimens of a rare *Papilio* (*P. porthaon*) from Delagoa Bay, reared in the Society's Gardens.

Prof. Howes exhibited a drawing of a head of *Palinurus penicillatus*, received from M. A. Milne-Edwards, and remarked on the assumption of antenniform characters by the left ophthalmite shown in this specimen.

A paper was read by Mr. W. F. Kirby, Assistant in the Zoological Department, British Museum, entitled "A Revision of the Subfamily *Libellulinæ*, with descriptions of new Genera and Species." The last compendium of this group was published by Dr. Brauer in 1868, in which forty genera were admitted. Mr. Kirby now raised the number to eighty-eight, all fully tabulated and described in his paper, which likewise included descriptions of fifty-two new species. Mr. Kirby gave a short sketch of the characters of the *Libellulinæ*, and more especially of the neuration, which he considered to be of primary importance.

Mr. R. Bowdler Sharpe read the third part of his series of notes on the Hume Collection of Birds, which related to *Syrnium maingayi*, Hume, and to the various specimens of this Owl in the British Museum.

A communication was read from Mr. A. Smith Woodward, on the presence of a canal-system, evidently sensory, in the shields of Pteraspidian fishes. Mr. Woodward described a specimen which seemed to prove that the series of small pits or depressions upon the shields of these ancient fishes, observed by Prof. Ray Lankester, are really the openings of an extensive canal-system traversing the middle layer of the shield.

A second communication from Mr. A. Smith Woodward contained some notes on the "lateral line" of *Squaloraja*, in which it was shown that the "lateral line" of this extinct Liassic Selachian was an open groove supported, as in the Chimæroids, by a series of minute ring-like calcifications.

June 7, 1887.—E. W. H. Holdsworth, Esq., F.Z.S., in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of May, and called attention to a Tooth-billed Pigeon, *Didunculus strigirostris*, brought home from the Samoan Islands, and presented to the Society by Mr. Wilfred Powell; to two Red-spotted Lizards, *Eremias rubro-punctata*, obtained at Moses' Well, in the Peninsula of Sinai, and presented to the Society by Mr. G. Wigan; and to a small scarlet Tree Frog, *Dendrobates typographus*, from Costa Rica, presented to the Society by Mr. C. H. Blomefield.

Mr. Sclater called attention to examples of two North-American Foxes now living in the Society's Gardens, which he referred to *Canis velox* and *C. virginianus*.

A communication was read from Mr. A. O. Hume, C.B., containing some notes on *Budorcas taxicolor*, the Gnu-goat or Takin of the Mishmee Hills, and some remarks on the question of the form of the horns in the female of this animal.

A communication was read from Mr. E. Symonds, containing notes on various species of Snakes met with in the vicinity of Kroonstadt, Orange

Free State, specimens of which had been forwarded to Mr. J. H. Gurney, and determined by Dr. Günther.

Mr. Martin Jacoby gave an account of a small collection of Coleoptera obtained by Mr. W. L. Sclater in British Guiana.

Prof. G. B. Howes read a paper on an hitherto unrecognised feature in the larynx of the Anurous Amphibians. This was the existence in many individuals of various species of a rudimentary structure, which appeared to correspond to the epiglottis of Mammals, and which in some instances attained a remarkable development as an organ of voice.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

June 1, 1887.—Dr. DAVID SHARP, F.Z.S., President, in the chair.

Mr. Philip Crowley exhibited the following specimens of Diurni, from the Kareen Hills, Burmah:—*Papilio Zaleucus*, Hew., *Papilio Adamsoni*, Smith, *Papilio* ? sp. (male and female), and *Nymphalis Nicholii*, Smith.

Mr. T. R. Billups exhibited several specimens of an ant found at Kew, frequenting a species of palm from Tropical Australia, and which had been determined as *Tapinoma melanocephalum;* also living specimens of *Carabus auratus*, from the Borough Market, and of a species of *Blaps* from Northern Africa.

Mr. Waterhouse exhibited a specimen of a Brazilian Locust, *Conocephalus* ? sp., which he had for some time preserved alive, and which had only died that same morning. He called attention to the change of colour which he had observed in the eyes of this insect; in a bright light they were dirty white or horn-coloured, with a black dot in the middle; but at night, or if the insects were confined in a dark box, they became altogether black; shortly after death, also, the eyes became black. Mr. M'Lachlan observed that he had noticed a darker spot in the centre of the eye in certain Ephemeridæ, and in other Neuroptera. The discussion was continued by Dr. Sharp and others, but no one seemed to be able to account for the alteration in question.

Lord Walsingham exhibited specimens of *Cateremna terebrella*, Zk., a species lately taken in Britain, which he had caught in Norfolk, and bred from fir-cones gathered in the same locality.

Mr. Meyrick read two papers, "On Pyralidina from Australia and the South Pacific" and "Descriptions of some exotic Micro-Lepidoptera." In these papers about sixty new species were described. A discussion ensued, in which Dr. Sharp, Mr. Stainton, Mr. M'Lachlan, and others took part. Mr. Meyrick stated that, as far as the Pyralidina were concerned, Australia could not be regarded as a separate region, for a large number were not endemic, but appeared to have been introduced from the Malay

Archipelago. The method of this immigration seemed doubtful. Mr. Meyrick was of opinion that the insects flew very long distances, and effected a settlement through their food-plants being widely distributed and common. He instanced the undoubted immigration of certain Australian species into New Zealand, a distance of 1200 miles. Mr. Stainton adduced the instance of *Margarodes unionalis*, which is a South-European insect, feeding on the olive, yet is occasionally found in Britain.

Mr. Meyrick exhibited, in connection with his papers, *Oxychirota paradoxa*, Meyr. (unique specimen representing the family Oxychirotidæ), *Epharpastis dædala*, Meyr., and *Mixophyla erminea*, Moore.

Mr. Meyrick also made some observations on the distribution of the insect fauna in the various regions of Australia; he said that it appeared to be more or less different in certain defined portions of the continent, which might be roughly regarded as oases in the midst of desert districts: all his observations, however, had tended to upset Mr. Wallace's theory that Eastern and Western Australia were originally separated, as the gradations in the insect fauna from east to west were quite gradual; in Western Australia the Tineina were the only group well represented by peculiar endemic forms.

Mr. Pascoe read a paper "On the genus *Byrsops*," a genus of Curculionidæ.

The President announced that Lord Walsingham's collection of Lepidoptera and larvæ, recently presented to the nation, would be exhibited in the Hall at the Natural History Museum, South Kensington, until the end of June.—W. W. F.

NOTICES OF NEW BOOKS.

A Nomenclature of Colours for Naturalists, and Compendium of Useful Knowledge for Ornithologists. By ROBERT RIDGWAY, Curator, Department of Birds, U. S. National Museum. 8vo, pp. 130, with ten coloured plates and seven plates of outline illustrations. Boston, U. S.

SOME five years ago the present writer, in advocating the desirability of adopting a standard of nomenclature for the description of the colours of natural objects, remarked:*—

"In the Animal Kingdom the number of colours is very great. They often form the most striking feature in the external appearance of species, and hence have been considered by systematists as affording distinguishing characters of much value. But an object may be described as of one colour by one person, and be taken by another person for quite a different tint; for the names of colours are frequently misapplied, and one name is often indiscriminately given to many colours. Hence arises an uncertainty in reading and a perplexity in writing a description which would be obviated were some standard of nomenclature available for general reference.

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* Proc. Zool. Soc. 1882, p. 391.

"So long ago as 1821 there appeared a manual the utility of which seems to have been quite lost sight of, owing, perhaps, chiefly to the fact that it has long been out of print and difficult to procure, namely, Werner's 'Nomenclature of Colours,' edited by Syme."

This work, excellent in principle, was designed to meet the very want which he now ventured to express, but which was hardly experienced at the date of its publication, inasmuch as it was not then the general practice to publish the careful and detailed descriptions of species with which we are now familiar.

Assuming the want of such a standard nomenclature, and the desirability of satisfying it, the writer was of opinion that the publication of a new edition of Werner's Manual, under the auspices of the Zoological Society, would ensure a speedy adoption of the standard, and would be the means of obviating in future the confusion hitherto prevailing for want of it.

The suggestion having been taken up by Mr. Ridgway, and carefully considered, has resulted in the publication of the volume now before us. It is not a new edition of Werner's Manual, however, but an entirely original work, divided into two parts, and covering a much larger field than that traversed by Werner.

Part I., on the Nomenclature of Colours, contains remarks on the principles of colour; on colours required by the zoological or botanical artist; and includes a comparative vocabulary of colours, in seven languages; and a bibliography containing the titles of seven works only, the subject being one on which it would seem that very little has been published.

Part II., entitled the "Ornithologist's Compendium," includes a glossary of technical terms, and tables for converting millimetres into English inches and decimals, and *vice versá*. Seventeen plates show the various shades (which are named) of all the primary colours with their combinations, and figures illustrating the internal anatomy and wing-surfaces of a bird, colour markings, egg contours, and a comparative scale of measurement standard—a veritable *multum in parvo.*

With regard to the patterns of colours, we find about twenty shades of each represented on each plate in small oblong squares, with the names immediately below them, and on the opposite page an indication of the colours which when combined will produce them. On the whole the result appears satisfactory, but we may point out that the plates being hand-coloured there must obviously be a risk of variation in different copies of the book—a difficulty which was obviated in Werner's Manual by having every shade of colour printed in sheets which were cut out into small pieces of the size required, and pasted on to the plates. In addition to this, and in order to illustrate his meaning better, Werner gave the name of such species in the animal, vegetable, and mineral kingdoms as have the particular shade of colour mentioned—an excellent plan to prevent misconception which Mr. Ridgway might have adopted with advantage.

Another point for criticism which occurs to us is this: in naming and figuring a particular colour, it seems to us that Mr. Ridgway's views do not always coincide with popular notions on the subject. To take various shades of *green*, for example: his "malachite-green" (No. 6) does not correspond to the colour of that mineral, which resembles rather what he names "viridian green" (No. 8), or "sea-green" (No. 5), while his "pea-green" (No. 9) reminds us rather of the dried than of the fresh pea, and his "emerald-green" (No. 16) is not the colour of an emerald. It may perhaps be said that these are really the shades which are known to artists and artists' colourmen by these particular names. If so the author must be absolved from blame, and we can only regret that the nomenclature has not been more accurately determined.

Mr. Ridgway's book in many respects will be found extremely useful to working naturalists, and the adoption by them of his standard of nomenclature, by securing uniformity, will obviate in future a deal of misconception which at present arises whenever the colours of a new species are loosely or inconsiderately described.

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